

User's Guide

P/N 072021-001

MobileLAN™ access 2102 S

 **ntermec**

A **UNOVA** Company

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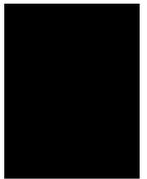
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Before You Begin

This section introduces you to standard warranty provisions, safety precautions, cautions, notes, document formatting conventions, and sources of additional product information.

Warranty Information

To receive a copy of the standard warranty provision for this product, contact your local Intermec sales organization. In the U.S. call 1-800-755-5505, and in Canada call 1-800-668-7043.



Note: Opening this product may void the warranty. The internal workings of this product can only be accessed by Intermec service personnel. Radio replacements and upgrades require Intermec service personnel.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this book before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Cautions and Notes

The cautions and notes in this guide use the following format.



Caution

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Conseil

Une précaution vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.



Note: Notes either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

About This Guide

The *MobileLAN™ access 2102 S User's Guide* provides information about the features of this product, and how to install, configure, and troubleshoot it. You must be familiar with your host PC and your other Intermecc equipment.

Terminology

In this guide, the terms 2102 S and access point are used to describe the 2102 S Access Point device.

Format Conventions for Input From a Keyboard or Keypad

This table describes the formatting conventions for input from host PC keyboards:

Convention	How to Interpret the Convention
Special text	Shows the command as you should enter it into the device.
<i>Italic text</i>	Indicates a variable that you must replace with a value.
Bold text	Indicates the keys you must press on a PC keyboard. For example, “press Enter ” means you press the key labeled “Enter” on the PC keyboard.
where	Introduces a list of parameters and explains the values you can specify for them.



Getting Started

This chapter introduces the 2102 S Access Point with the MobileLAN™ access utility and explains how to install it.

Understanding the 2102 S Access Point

The 2102 S access point is designed to be powerful and easy to use. It attaches to a wired network and provides wireless network access for end devices.

The MobileLAN access utility is designed to help you make simple configuration changes to your access point. You can upgrade the access point firmware from the utility, as well as access the Web browser menus to make further configuration changes.

The 2102 S ships with these items:

- Power supply (Part No. 3-304029-01) and AC power cord
- Mounting bracket
- Safety information
- Antenna



The 2102 S with an IEEE 802.11b High Rate (HR) radio installed is Wi-Fi™ certified for interoperability with other 802.11b HR wireless LAN devices.



Caution

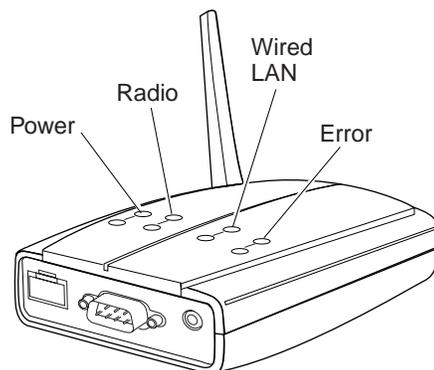
You must use the appropriate Intermec power supply with these devices or equipment damage may occur.

Conseil

Vous devez utiliser la source d'alimentation Intermec adéquate avec cet appareil sinon vous risquez d'endommager l'équipement.

Understanding the LEDs

The following illustration identifies the four LEDs on the 2102 S.



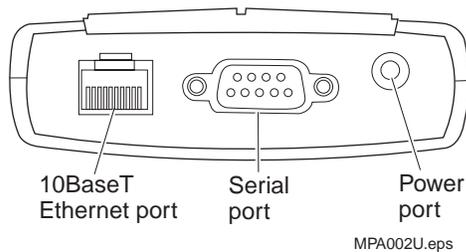
MPA001U.eps

The following table describes the LEDs on the 2102 S.

LED	Description
Power	Remains on when power is applied.
Radio	Flashes when a frame is transmitted or received on the radio port.
Wired LAN	Flashes when a frame is transmitted or received on the Ethernet port.
Error	Flashes during normal operation. Remains on if an error is detected.

Understanding the Ports

The following illustration identifies the ports on the 2102 S.



The following table describes the ports on the 2102 S.

Port	Description
10BaseT port	Used with an appropriate cable, the 10BaseT port connects the access point to your Ethernet network.
Serial port	Used with a null-modem cable, the serial port connects the access point to a terminal or PC to perform initial configuration.
Power port	Used with an appropriate power cable, the power port connects the access point to an AC power source.

General Installation Guidelines

Intermec recommends that you have Intermec or other certified providers conduct a site survey to determine the ideal locations for all of your network components. A proper site survey requires special equipment and training.

The following general practices should be followed in any installation:

- Locate access points centrally within areas requiring coverage.
- Overlap access point coverage areas to avoid coverage holes.
- Try to position the access point so its LEDs are visible. The LEDs are useful for troubleshooting.
- Install wired LAN cabling within node limit and cable length limitations.
- Use an uninterruptible power supply when the AC power system is not reliable.

See Appendix B for information about antenna placement and accessories.



Note: Microwave ovens operate in the same frequency band as 802.11b HR radios; therefore, if you use a microwave within range of your 2102 S, you may notice performance degradation. Both your microwave and your 2102 S will continue to function, but you may want to consider relocating your microwave out of range of your access point.

Installing the 2102 S Access Point

Follow these steps to install the 2102 S.

1. Mount the access point.
2. If necessary, attach an external antenna. For more information, see “Attaching an External Antenna” in Appendix B.

Mounting the 2102 S Access Point

You can install the 2102 S horizontally on a desk or counter, or you can install it vertically on a wall using the wall bracket that ships with it. Follow the instructions that ship with the bracket and access point. An optional cubicle bracket is also available for mounting the 2102 S on a cubicle wall.

These optional mounting bracket kits and accessories are available for the 2102 S:

- Cubicle bracket kit (Part No. 070440)
- Power supply holder kit (Part No. 069893)
- Dual antenna bracket kit (Part No. 069888)
- Diversity antenna (Part No. 071489)

Contact your Intermec representative for more information about ordering access point accessories.

The following instructions explain how to mount the 2102 S using the mounting bracket that ships with it.

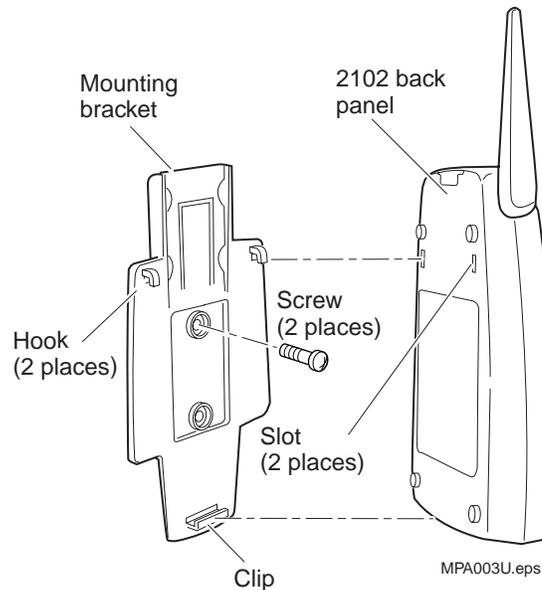
Install the mounting bracket and 2102 S on a sturdy surface in accordance with local building codes. You need the following tools and materials to install the bracket:

- Two #5 or M3 screws. The screws should be appropriate for the surface on which you are mounting the bracket.
- Drill and drill bit appropriate for the mounting screws
- Screwdriver

To mount the 2102 S

1. Use the mounting bracket as a template to mark the location of the mounting holes on the mounting surface.
2. Drill the mounting holes.
3. Position the bracket on the mounting surface.

Positioning the Bracket



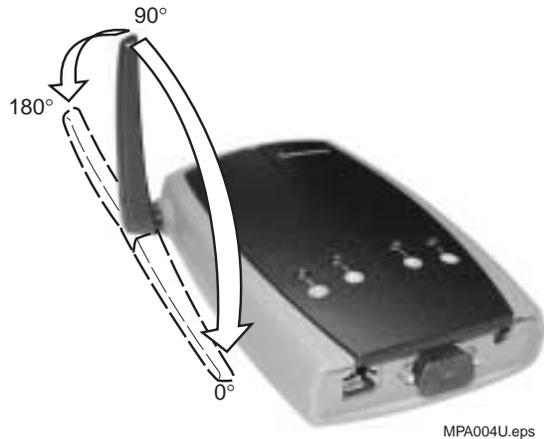
4. Using the screws you provided, secure the bracket to the wall.
5. Fit the slots on the back of the 2102 S over the hooks on the mounting bracket.
6. Slide the 2102 S up slightly, and then press the base of the 2102 S until it clicks into the clip at the bottom of the mounting bracket.

Positioning the Antenna

The 2102 S features a built-in antenna that rotates 180° as shown in the next illustration. Use the following guidelines when positioning the antenna.

- Place the antenna at 0° when storing the 2102 S.
- Place the antenna at 90° when using the 2102 S horizontally; for instance, when the 2102 S is positioned on a desk or counter.
- Place the antenna at 180° when using the 2102 S vertically; for instance, when the 2102 S is mounted on a wall or cubicle.

Positioning the Antenna



Note: Do not force the antenna past the hard stop at 0° or 180° or you may break the antenna connector.

You are now ready to configure the 2102 S.

Setting the IP Address of the 2102 S Access Point

You can use the MobileLAN access utility to set an initial IP address in your access point. To use the MobileLAN access utility, you must have the following:

- Windows95-OSR2/98SE/ME, Windows NT4.0/2000
- Access Point software release 1.60

To set the IP address of the 2102 S using the MobileLAN access utility

1. Install the MobileLAN access utility on your PC.
 - a. Place the MobileLAN access utility CD-ROM in the CD-ROM drive of your PC. The setup program runs automatically. Follow the instructions that appear on your screen. If the setup program does not run automatically, navigate to your CD-ROM drive and double-click MLASetup.exe. Follow the instructions that appear on your screen.
2. Open the MobileLAN access utility by double-clicking the MobileLAN access utility shortcut on your desktop.



Note: You must have the IP address and MAC address (located on the bottom of the 2102 S) of your access point before performing the next steps.

3. Be sure the access point is not turned on, and then click Set IP Address.

4. Enter an unused IP address for the access point in the New IP Address for AP field.
5. Enter the MAC address of the access point in the AP Ethernet MAC Address field.
6. Click Set AP, and then turn on the access point. The status bar indicates the status of the access point as it completes the configuration.



Note: You must complete Steps 3 through 6 before the access point has been running for more than 60 seconds, or you will need to reboot the access point.

7. When the configuration process is complete, click Configure AP to launch a Web browser to further configure the access point.

Resetting the 2102 S to Factory Defaults

This section explains how to reset the 2102 S to its factory defaults.

To reset the access point to factory defaults

1. Be sure the access point is not turned on, and then click Set Defaults.
2. Enter the current IP address of the access point in the Current IP Address of AP field.
3. Click Set AP, and then turn on the access point. The status bar indicates the status of the access point as it resets.



Note: You must complete Steps 2 and 3 before the access point has been running for more than 60 seconds, or you will need to reboot the access point.

2

Configuring the 2102 S

This chapter explains how to establish a Web browser session and how to manage the 2102 S remotely.

Establishing a Web Browser Session

After you have configured the IP address and other basic network parameters, you can access your 2102 S from a remote location.



Note: Although you can manage the device remotely using either a Telnet session or a Web browser, this manual assumes you are using a Web browser.

You must know the IP address of the access point to access it remotely. If a DHCP server assigned the IP address, you must determine the IP address from the DHCP server.

Only one session can be active with the access point at a time. If your session terminates abruptly or a new signon screen appears, someone else may have accessed the access point.

To access the access point remotely, you must first establish a Web browser session. When using the Web to establish remote access to your access point, remember that if you have a username and password configured for the access point, your session terminates if you do not use it for 15 minutes.

The Web browser interface for the access point has been tested using Netscape v4.0 and higher and Internet Explorer v4.0 and higher. Remotely accessing the access point using other browsers may provide unpredictable results.



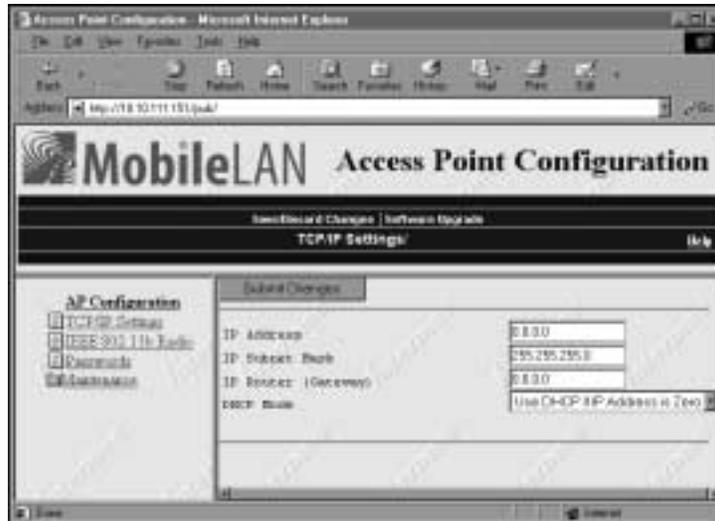
Note: If you access the Internet using a proxy server, you must add the IP address of the access point to your Exceptions list. The Exceptions list contains the addresses that you do not want to use with a proxy server.

To establish a Web browser session with the access point

1. Identify the IP address of the access point.
2. Start the Web browser application.
3. Access the access point using one of these methods:
 - In the Address field (Internet Explorer) or the Location field (Netscape Communicator), enter the IP address of the access point, and press **Enter**.
 - Choose Open from the File menu. In the Open field, enter the IP address of the access point and press **Enter**.

The TCP/IP Settings screen appears.

The TCP/IP Settings Screen



Your Web browser session is established.

Changing the User Name and Password

To ensure security to your access point, you can make changes to your access point security parameters after you establish a Web browser session.

To change the user name and password

1. Establish a Web browser session. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Passwords. The Passwords screen appears.

The Passwords Screen



3. Type a user name in the User Name field and a password in the Password field. The User Name and Password can each be up to 16 characters long. Click Submit Changes and follow the instructions that appear on your screen to save your changes.
4. Click Save/Discard Changes, and then reboot the access point. The new user name and password are saved, and you must enter these new values each time you establish a Web browser session for your access point.

Configuring the 2102 S Access Point as a DHCP Server

The 2102 S access point contains a simple DHCP server that you can use to provide DHCP server functions for small installations where no other DHCP server is available. The DHCP server will offer IP addresses to any DHCP client it hears as long as a pool of unallocated IP addresses is available. These clients may include other access points, wireless clients, wired hosts on the distribution LAN, or wired hosts on secondary LANs.

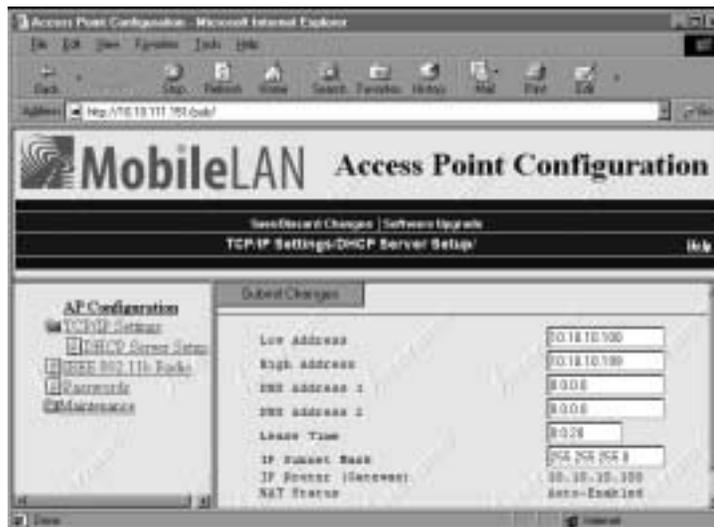


Note: This DHCP server is not intended to replace a general purpose, configurable DHCP server, and it makes no provisions for synchronizing DHCP policy between itself and other DHCP servers. Customers with complex DHCP policy requirements should use other DHCP server software.

You must configure an access point acting as a DHCP server with a static IP address.

To configure the 2102 S access point as a DHCP server

1. Establish a Web browser session. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click TCP/IP Settings and configure the following parameters:
 - Subnet mask
 - Static IP address
3. Enable the server.
 - a. In the TCP/IP Settings screen, click the DHCP Mode down arrow and choose This AP is a DHCP Server.
 - b. Click Submit Changes and follow the instructions that appear on your screen to save your changes.
4. Configure the DHCP server.
 - a. Click DHCP Server Setup. The DHCP Server Setup screen appears.



- b. Configure the DHCP server. When you are finished, click Submit Changes and follow the instructions that appear on your screen to save your changes.

The table on the next page explains each parameter.

DHCP Server Parameters

Parameter	Explanation
Low Address	Specifies the low IP address in the range of IP addresses available to the DHCP server for distribution to DHCP clients. If these addresses are not on the same subnet as the access point, the access point will perform Network Address Translation (NAT) for the devices to which it grants IP addresses.
High Address	Specifies the high IP address in the range of IP addresses available to the DHCP server for distribution to DHCP clients. If these addresses are not on the same subnet as the access point, the access point will perform Network Address Translation (NAT) for the devices to which it grants IP addresses.
DNS Address 1	Specifies the IP address of a Domain Name Server that will be distributed to DHCP clients. You can enter up to two DNS addresses to be delivered to DHCP clients.
DNS Address 2	Specifies the IP address of a Domain Name Server that will be distributed to DHCP clients. You can enter up to two DNS addresses to be delivered to DHCP clients.
IP Subnet Mask	Indicates how many host bits of the IP address represent a subnet number. Use IP subnets to partition traffic and to connect routers. The IP subnet mask must represent contiguous ones (1) from the left and contiguous zeros (0) from the right.
IP Router (Gateway)	Specifies what IP router DHCP will be offering to clients. If NAT has been automatically enabled, the access point will use the lowest DHCP address to provide an IP router that performs NAT.
NAT (Network Address Translation) Status	Specifies if DHCP has been properly configured and if the range has automatically enabled NAT. NAT operation is disabled or enabled automatically depending on the continuous range of addresses you enter into the DHCP Server. NAT is disabled if the range of addresses to be given to DHCP clients is on the same subnet as the access point. If the range of addresses to be given out by the DHCP server is not on the same subnet as the access point, you are creating a virtual network and the DHCP server will also perform NAT translation.

Supported DHCP Options

The DHCP server issues IP address leases to configure the following fields and options:

IP broadcast address This address, along with the subnet mask and default router, will contain the same values as configured for the access point.

Lease duration The default lease duration is twenty minutes.

Unsupported DHCP Options

The DHCP server implemented in the 2102 S access point does not support any DHCP options other than those listed on this page. The DHCP server disregards any DHCP options that are not explicitly required by the DHCP specification. The DHCP server ignores all packets with a non-zero giaddr (gateway IP address). The DHCP server only responds to requests emanating from its own subnet.

Configuring the 2102 S Access Point as a NAT Server

1. Establish a Web browser session. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click TCP/IP Settings and configure the following parameters:
 - Subnet mask
 - Static IP address
3. Choose This AP is a DHCP Server in the DHCP Mode field.
4. Click DHCP Server Setup and verify that the range of NAT addresses that are automatically assigned will be valid for your environment. If you need to change the IP addresses, be sure to enter a contiguous range of IP addresses that are not on the same subnet as the IP address you have configured for your access point.
5. Click Submit Changes and follow the instructions that appear on your screen to save your changes.
6. Configure any optional parameters.

3

Configuring the Radio

This chapter explains how to configure your radio.

Configuring the 802.11b HR Radio

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click IEEE 802.11b Radio. The IEEE 802.11b Radio screen appears.



3. Configure the parameters for the radio. When you have finished, click Submit Changes and follow the instructions that appear on your screen to save your changes.

The table on the next page explains each parameter.

802.11b HR Radio Parameters

Parameter	Explanation
SSID (Network Name)	The 802.11b HR radio communicates with other 802.11b HR radios with the same network name. Use this parameter to assign a network name to the access point, and then assign the same network name to the end devices that will connect to the access point. The SSID (Network Name) can be no more than 32 alphanumeric characters. The default SSID (Network Name) is INTERMEC (case-sensitive).
Data Rate	Determines the bit rate for data transmission. In general, higher speeds mean shorter range and lower speeds mean longer range.
Data Rate Fallback	Determines if the radio will fall back to slower speeds when it is unable to deliver a packet. Interference or range limitations may make it impossible to deliver a packet at the default rate. If this option is enabled, the access point will attempt to deliver the packet at a slower rate which may have greater range or interference tolerance.
Basic Rate	Determines the bit rate for Multicast data transmission. In general, higher speeds mean shorter range and lower speeds mean longer range. In an installation with mixed speed settings, this parameter must be set no higher than the maximum speed of the lowest rate terminal which must receive Multicast traffic.
Frequency	<p>The frequency is the particular frequency within the 2.4 to 2.5 GHz range that the access point uses to transmit and receive packets. The available frequencies are country-dependent and are determined by the radio.</p> <p>Configure all access points used in Spain, France, or Japan to a common frequency. For all other countries, you can configure all access points to a common frequency, or you can select up to three frequencies that are at least three channels (or 25 MHz) apart. You could select 2412 MHz, 2437 MHz, and 2462 MHz, for example.</p> <p>You may want to use a single frequency to isolate the installation to part of the band; for example, use a single frequency if other DS systems or multiple microwave ovens are in use in the area.</p> <p>For optimal performance of access points that are within range of each other, you should configure their frequencies to be five channels apart. You could configure the access points to use channels 1, 6, and 11, for example.</p>
WEP Encryption	Use this option to enable or disable WEP encryption. This option appears on your menu only if your 802.11b HR radio supports WEP data encryption for wireless communication.

Worldwide Frequencies for the 802.11b HR Radio

Channel	FCC	ETSI	France	Japan	Israel
1	2412	2412		2412	
2	2417	2417		2417	
3	2422 (default)	2422		2422	2422
4	2427	2427		2427	
5	2432	2432		2432	
6	2437	2437		2437	
7	2442	2442		2442	
8	2447	2447		2447	
9	2452	2452		2452	
10	2457	2457	2457	2457	
11	2462	2462	2462 (default)	2462	
12		2467	2467		
13		2472	2472		
14					

FCC countries include the United States, Canada, China, Taiwan, India, Thailand, Indonesia, Malaysia, Hong Kong, and most South American countries.

ETSI countries include all European Union countries except France. It also includes Switzerland, Iceland, Norway, Czech Republic, Slovenia, Slovakia, Turkey, Russia, and the United Arab Emirates.

Mexico and Singapore use the same channels as France.

The 802.11b HR channels that are allowed in a given country may change without notice. Be sure you use only those frequencies that are permissible in the given country.

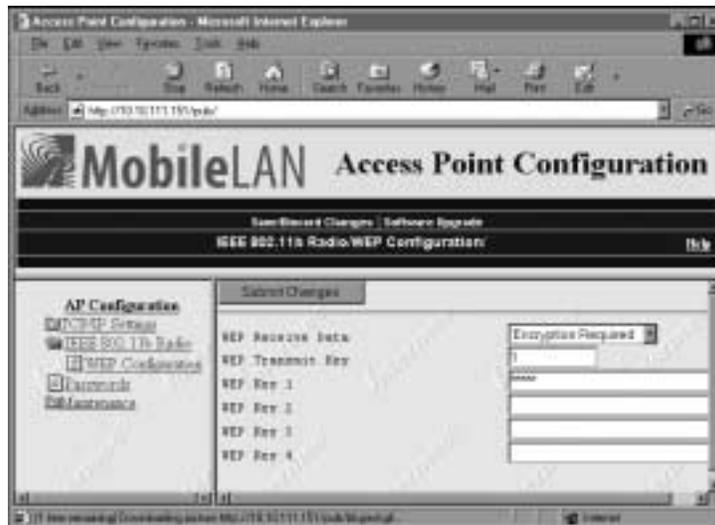
Configuring WEP

Click WEP Configuration under the IEEE 802.11b Radio menu to set WEP configuration parameters. This option appears only if your 802.11b HR radio supports WEP encryption and you enabled WEP Encryption.

To set WEP configuration parameters

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Choose IEEE 802.11b Radio.
3. Enable WEP Encryption.

- Click WEP Configuration in the IEEE 802.11b Radio menu. The WEP Configuration screen appears.



- Set the parameters for WEP configuration. Click Submit Changes and follow the instructions that appear on your screen to save your changes.

The following table explains each parameter.

Parameter	Explanation
WEP Receive Data	Use this parameter to determine if the access point will receive transmissions from end devices that are not using WEP. Unencryption Allowed Allows transmissions from end devices that are not using WEP. Encryption Required Prevents transmissions from end devices that are not using WEP.
WEP Transmit Key	Use this parameter to determine which of the four default WEP keys this access point uses to transmit data. The default is 1, which means that the access point uses WEP key 1 to transmit data.
WEP Key 1	WEP code 80211 by default.
WEP Key 2	Your own WEP code.
WEP Key 3	Your own WEP code.
WEP Key 4	Your own WEP code.

To ensure maximum security, you should configure each WEP key with a different WEP code.

4

Maintaining and Troubleshooting the 2102 S

This chapter explains how to upgrade your 2102 S, and it answers some commonly asked questions about the 2102 S.

Analyzing the 2102 S Access Point

You can view different parameters configured for the 2102 S, including AP Connections, DHCP Status, and Port Statistics. The information on these screens may be needed when you call Intermec Technical Support.

Viewing AP Connections

AP Connections shows information about the end devices connected to the access point.

To view information about devices connected to the access point

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance.
3. Click AP Connections. The read-only AP Connections screen appears showing information about the devices connected to the access point.



Viewing Port Statistics

The Port Statistics screen shows the total number of frames and bytes that the access point has transmitted and received since it was last booted.

To view port statistics

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance.
3. Click Port Statistics. The read-only Port Statistics screen appears showing the frames and bytes transmitted and received.

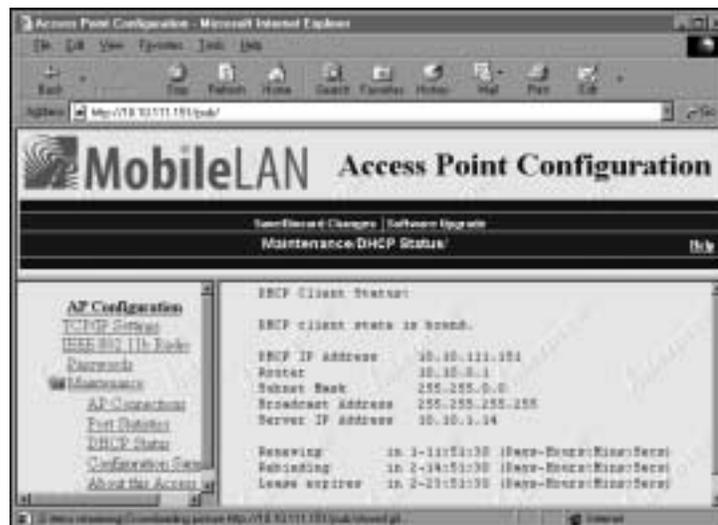


Viewing the DHCP Status

The DHCP Status screen shows the IP addresses that are available, in use, or expired.

To view the DHCP status

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance.
3. Click DHCP Status. The read-only DHCP Status screen appears listing all available, in use, and expired IP addresses.



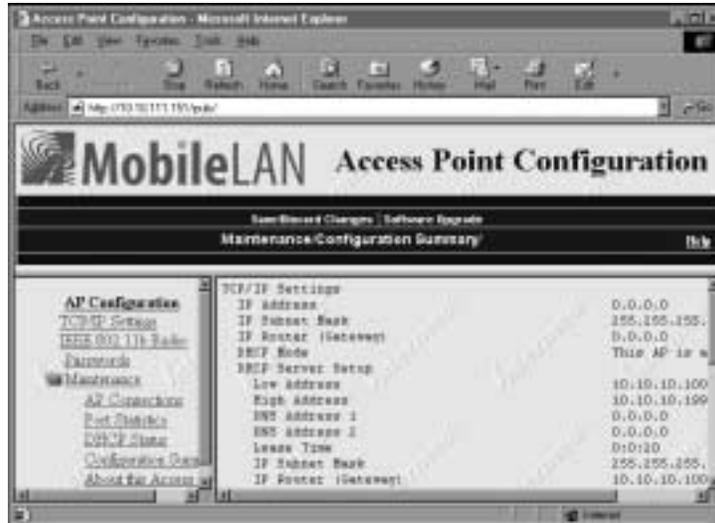
Viewing the Configuration Summary

The Configuration Summary screen summarizes the major configuration settings and installed hardware for the access point.

To view the configuration summary

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance.
3. Click Configuration Summary. The read-only Configuration Summary screen appears listing each parameter in the access point and its current configuration.

The Configuration Summary Screen



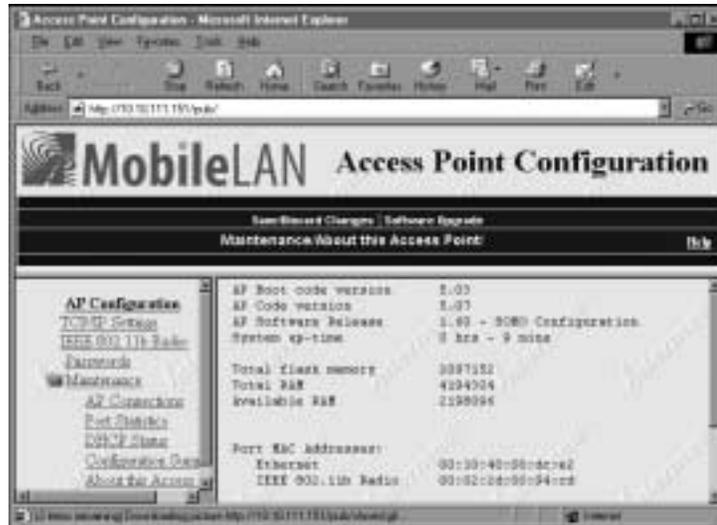
Viewing Information About the Access Point

The About this Access Point screen shows information about the access point including software version, radio version, and MAC address.

To view information about the access point

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance.
3. Click About this Access Point. The read-only About this Access Point screen appears showing information about the access point.

The About this Access Point Screen



Understanding the LED Lighting Sequence

When the 2102 S is powered on, the LEDs flash as the access point boots and performs internal diagnostics.

The next table describes the LED activity during the boot process.

Power	Radio	Wired LAN	Error	Description
On	Off	Off	On	Flash checksum being calculated
On	On	Off	On	Flash checksum failure
On	Off	On	Off	RAM test in progress
On	On	On	Off	RAM test failure
On	Off	Off	Off	Monitor loading in progress
On	Off	Off	On	Ethernet test in progress
On	On	Off	On	Ethernet test failure

After the access point successfully boots, the LEDs display the following pattern:

Power	Radio	Wired LAN	Error
On	Flashes	Flashes	Flashes during normal operation

Upgrading the 2102 S Access Point Firmware

For optimal performance, you should install the most current firmware version on your access point. Firmware releases are available from www.mobilelan.intermec.com.

You can install the firmware release using

- the MobileLAN access utility. For more information, see “Using the MobileLAN access Utility” in the next section.
- a Web browser session. For more information, see “Using a Web Browser” later in this chapter.

Using the MobileLAN access Utility

To upgrade the firmware using the MobileLAN access utility, you must first install the firmware release on your PC, and then upload the release to your access point.

To install the firmware release on your PC

1. Navigate your Web browser to <http://mobilelan.intermec.com> and click Software Downloads.
2. Choose the latest firmware release from the list of available software downloads, and follow the instructions that appear on your screen.

After you have saved the firmware release on your PC, use the MobileLAN access utility to upload the file from your PC to the access point.

To upload the firmware using the MobileLAN access utility

1. Click Upgrade in the MobileLAN access utility. The upgrade screen appears.



2. Enter the IP address of access point you want to upgrade.
3. Enter the drive and filename of the upgrade file, or click Browse to locate the file.
4. Click Start Upgrade. The upgrade may take up to three minutes to complete.
5. When the upgrade is complete, reboot the access point (by unplugging it from the power source and plugging it back in) to activate the new firmware.

Using a Web Browser

To upgrade the firmware using a Web browser session, you must first install the firmware release on your PC, and then upload the release to your access point. For more information about the firmware, see the release notes that accompany the firmware release.

To install the firmware release on your PC

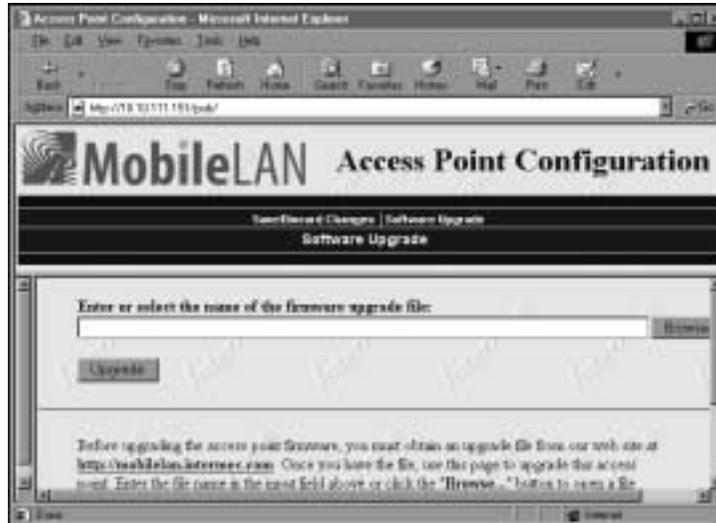
1. Navigate your Web browser to <http://mobilelan.intermec.com> and click Software Downloads.
2. Choose the latest firmware release from the list of available software downloads, and follow the instructions that appear on your screen.

After you have saved the firmware release on your PC, use the Web browser interface to upload the file from your PC to the access point.

To upload the firmware release using the Web browser interface

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.

2. Click Software Upgrade. The Software Upgrade screen appears.



3. Enter the name of the upgrade file, or click Browse to locate the file.
4. Click Upgrade to start the upgrade. The upgrade may take up to three minutes to complete.
5. When the upgrade is complete, reboot the access point to activate the new firmware.

Troubleshooting the Radio

If the radio is faulty or the configuration matrix string is incorrect, the LEDs on the access point display the following pattern after the access point boots:

Power	Radio	Wired LAN	Error
On	Off	On	On

Commonly Asked Technical Support Questions

Problem/Question	Possible Solution/Answer
Is the access point fully booted?	When the access point is fully booted, the Power LED remains steady green and the Wired LAN LED flashes.
The Power LED is not on.	The access point may have a hardware problem. <ol style="list-style-type: none"> 1. Make sure the power cable is firmly plugged into the access point and the power source. 2. Unplug the access point, and then plug it back into the power source. Verify that the Power LED remains on. 3. Call Intermec Technical Support.
You cannot configure the access point locally using the serial port.	<ol style="list-style-type: none"> 1. Verify that you are using a null-modem cable to connect the access point to your terminal or PC. 2. Verify that your terminal or PC is set to 9600, N, 8, 1, no flow control. 3. Your system may be in autobaud mode. Reboot and press a key once per second until the signon screen appears.
You cannot connect to the access point using a Web browser.	If you access the Internet through a proxy server, be sure you have added the IP address of the access point to the Exceptions list.
You need to verify the WEP keys.	You cannot verify the WEP keys. The keys are encrypted after you enter them and are never displayed again. You may need to reconfigure your access points and end devices to reset the WEP keys.
The throughput seems slow.	<ul style="list-style-type: none"> • Verify that your antennas are well placed and that they are not blocked by metal or other obstacles. • You may want to add a second access point and implement roaming if you move the antenna closer to the device and throughput increases.

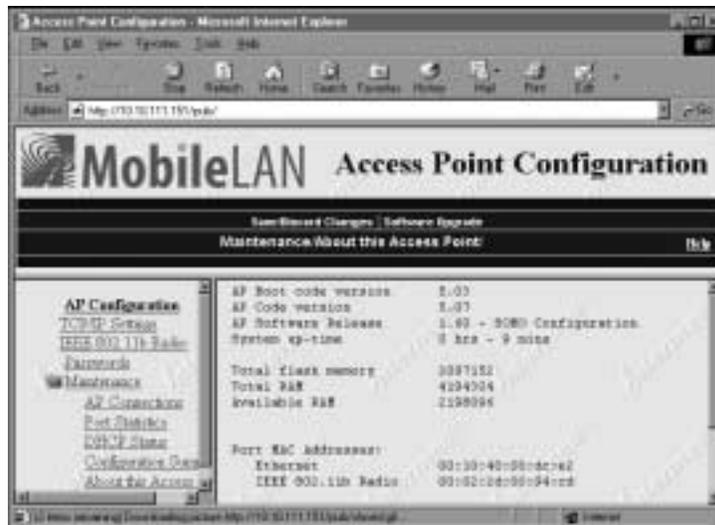
Getting Help with Your Installation

The 2102 S is designed to be easy to install and configure; however, you may need to call Intermec Technical Support if you have problems. Before calling, be sure you can answer the following questions:

- What were you doing when the error occurred?
- What error message did you see?
- Can you reproduce the problem?
- What version of access point firmware are you using?

To confirm the firmware version on your access point

1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click Maintenance, and then click About this Access Point. The About this Access Point screen appears.



You should have the information on this screen available when you call Intermecc Technical Support.

In the United States, call Intermecc Technical Support at 1-800-755-5505. Outside the United States, call your local Intermecc office.



Specifications and Default Settings

This appendix provides specifications and system defaults for reference purposes only. Actual product performance and compliance with local telecommunications regulations may vary from country to country. Intermec only ships products that are type approved in the destination country.

Physical Specifications

Operating Temperature	-20°C to +65°C (-4°F to +149°F)
Storage Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity (non-condensing)	10 to 90%
Electrical	~100 to 240V 1.0 to 0.5A 50 to 60 Hz
Weight	232 g (0.51 lb)
Height	9.32 cm (3.67 in)
Length	14.66 cm (5.77 in)
Width	3.53 cm (1.39 in)

Other Specifications

Architecture	Transparent bridge
Ethernet interfaces	10BaseT (twisted-pair)
Data rate	10 Mbps (Ethernet)
Media Access protocol	CSMA/CD
Ethernet compatibility	Ethernet packet types and Ethernet addressing
Filtering rate	14,880 frames per second
Filters (protocol)	AppleTalk, NetBEUI, IPX, IP, DECNET, Other
Filters (others)	IP ARP, Novell RIP, SAP, LSP
Serial port max data rate	115,200 bps
Management interfaces	SNMP, Web browser-based manager, text-based menu system, serial port, Telnet, Ethernet
Software upgrades	Downloadable over the network or serial port
SNMP agent	Version 1 RFC 1213

Radio Specifications—IEEE 802.11b HR

Data rate	11 Mbps (High), 5.5 Mbps (Medium), 2 Mbps (Standard), 1 Mbps (Low) with automatic fallback for increased range
Channels	11 (North America), 13 (Europe), 4 (France), 11 (Japan)
Range (11 Mbps)	160 m (525 ft) open environment 50 m (165 ft) semi-open environment 24 m (80 ft) closed environment
Frequency band	2.4 to 2.5 GHz world-wide
Radio type	Direct sequence, spread spectrum
Radio power output	32 mW (15 dBm)

Default Settings

The factory default settings for the 2102 S are listed in this section. You can record the settings for your installation in each table for reference.

TCP/IP Settings Menu Defaults

Parameter Name	Range	Default	Site Setting
IP Address	4 nodes, 0 to 255	0.0.0.0	
IP Subnet Mask	4 nodes, 0 to 255	255.255.255.0	
IP Router (Gateway)	4 nodes, 0 to 255	0.0.0.0	
IP Frame Type	DIX/SNAP	DIX	
DHCP Mode	Always, Disabled, Enabled (if 0), or DHCP Server	Always Use DHCP	
DHCP Server Name	0 to 31 characters	(blank)	

Ethernet Port Configuration Menu Defaults

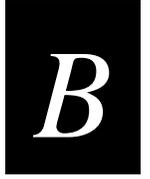
Parameter Name	Range	Default	Site Setting
Port Control	Enabled/Disabled	Enabled	

Password Menu Defaults

Parameter Name	Range	Default	Site Setting
User Name	up to 16 characters	user name not required	
Password	up to 16 characters	password not required	

IEEE 802.11b HR Radio Menu Defaults

Parameter Name	Range	Default	Site Setting
SSID (Network Name)	0 to 32 characters	INTERMEC	
Data Rate	1, 2, 5.5, or 11 Mbits	11 Mbits	
Data Rate Fallback	Enabled or disabled	Enabled	
Basic Rate	1, 2, 5.5, or 11 Mbits	2 Mbits	
Frequency	Channel 1 to 14, 2400 to 2500 MHz	Channel 3, 2422 MHz	
WEP Encryption	Enabled/Disabled	Disabled	
WEP Configuration			
WEP Receive Data	Unencryption Allowed/ Encryption Required	Encryption Required	
WEP Transmit Key		1	
WEP Key 1		80211	
WEP Key 2		(blank)	
WEP Key 3		(blank)	
WEP Key 4		(blank)	



Using External Antennas

This appendix provides information about attaching and positioning external antennas with the 2102 S. Specific guidelines for antenna separation are provided for those configurations that have multiple antennas.

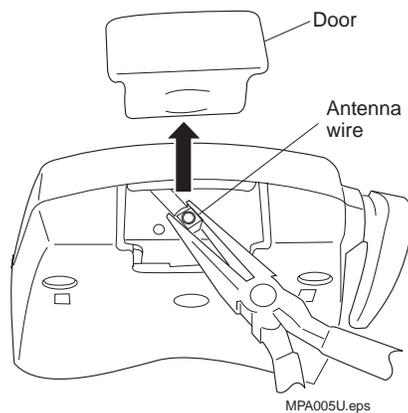
Attaching an External Antenna

You can attach an external antenna to the 2102 S. To attach an external antenna, you must disconnect the built-in antenna and attach an antenna cable directly to the radio card in the access point. The following steps explain how to attach an antenna cable to the 2102 S.

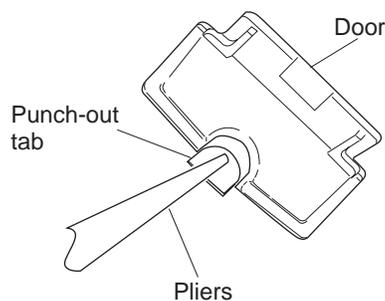
For more information about antenna options, contact your local Intermecc representative.

To attach an external antenna to the 2102 S

1. Remove the radio card door.
2. Pull straight up on the antenna wire to disconnect it from the radio card.



3. Tuck the antenna wire inside the access point housing.
4. Remove the punch-out tab from the door.



5. Attach the antenna cable to the radio by inserting the cable connector into the radio card.
6. Replace the door.

General Antenna Placement Guidelines

Proper antenna placement can help improve range. For information about antenna options, contact your Intermec representative. Here are some general guidelines for positioning antennas:

- Place the antenna as high as possible. In an office environment, try to place it above cubicle walls.
- Do not place a sheet of metal (such as a filing cabinet) between two antennas.

The following sections provide detailed information about antenna placement for those access points that can have more than one antenna.

Positioning Antennas for IEEE 802.11b HR Radios

The 802.11b HR radio features antenna diversity, which means that two antennas can be attached to a single radio. The antenna ports on the radio card are marked | and ||. Port | is the send/receive port; port || is the receive-only port. (Note that the antenna diversity system uses only one antenna at a time.)

Intermec recommends that you use two antennas for optimal performance of your 802.11b HR radio. If you attach only one antenna to the 802.11b HR radio, you must attach it to Port |. Both antenna ports are visible on the 2102 S.

Positioning Antennas for Antenna Diversity

If you are using two antennas for one 802.11b HR radio, placement of the antennas is critical because each antenna has a particular function. Antennas placed too close together may cause interference with each other. Antennas placed too far apart may not be able to establish two-way communications with other radios. To achieve optimum placement for the two antennas, you must place the transmit/receive antenna so that it is within range of all the radios that the receive-only radio can hear.

Note these important points about antenna placement for an 802.11b HR radio:

- Use external antennas to achieve the recommended antenna separation for placement of either omni or directional antennas.
- Position directional antennas so they point in the same direction.



- Follow the recommended antenna separation precisely when using the closest distances. Movement of as little as 3.05 centimeters (1.2 inches) may strongly affect performance.
- Position the antennas so that both antennas are within range of the radios they need to communicate with.
- Do not position the two antennas around a corner or so that a wall is between them.

The recommended antenna separation is listed in the following table. You should choose the greatest distance possible within the constraints of your environment.

Location	Recommended Antenna Separation
Highly reflective warehouse environment	0.33 m (13 in) or 0.64 m (25 in)
Moderately reflective warehouse environment	0.64 m (25 in), 1.22 m (4 ft), or 1.83 m (6 ft)
Open/Office environment	1.22 m (4 ft) to 3.05 m (10 ft)

Intermec 2.4 GHz Antennas and Antenna Accessories

The following table identifies many of the Intermec antennas and antenna accessories for the 802.11b HR radio. Contact your Intermec representative for detailed information.

Part Number	Description
069753	Antenna, 2.4 GHz Omni
069903	Antenna, 2.4 GHz Omni, 802.11b HR
070140	Antenna, 2.4 GHz, 3dBi Mini Flat (OpenAir)
070141	Antenna, 2.4 GHz, 3dBi Mini Flat (802.11b HR)
067261	Antenna, 2.4 GHz, 3dBi Mini Omni
067262	Antenna, 2.4 GHz, 5dBi Dual Flat
063363	Antenna, 2.4 GHz, 5dBi Omni
063365	Antenna, 2.4 GHz, 15dBi Yagi
065349	Antenna, 2.4 GHz, 9dBi Omni
067263	Antenna, 2.4 GHz, 9dBi Flat Panel
071121	Antenna, diversity
071122	Antenna, corner
069886	Adapter cable, OpenAir (to cable)
069887	Adapter cable, 802.11b HR (to cable)
070402	Adapter cable, OpenAir (to antenna)
070403	Adapter cable, 802.11b HR (to antenna)
061475	Cable connector, Type N polarized
063146	Cable connector, Type N
063198	Splitter, 2.4 GHz only
063245	Cable, 1.5 m (5 ft)
063246	Cable, 6.1 m (20 ft)
064616	Cable, 7.6 m (25 ft)
064432	LMR400 cable, 30.5 m (100 ft)
589377	LMR400 cable prep tool
061868	Lightning suppressor and bracket
586610	Lightning suppressor capsule
071489	Antenna, 2.4 GHz, Diversity



Configuring HereUAre



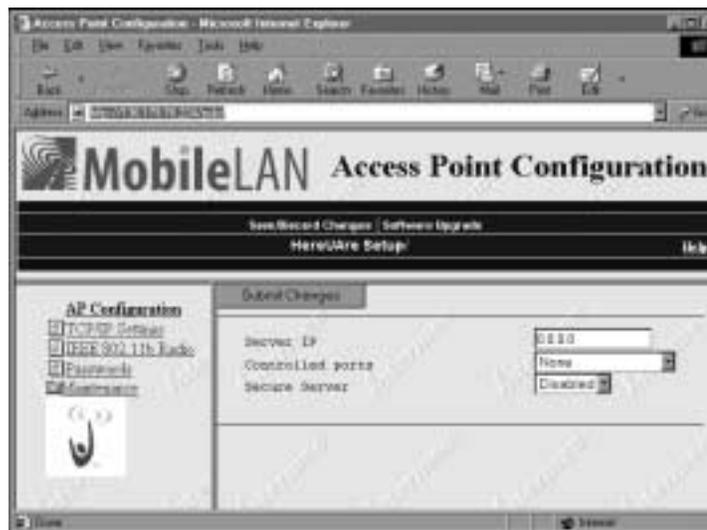
This appendix explains the HereUAre option and how to configure it.

About HereUAre

Using HereUAre, you can make Internet access available to your customers and charge them for that access time.

To configure HereUAre

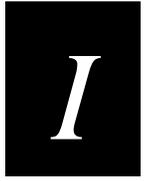
1. Establish a Web browser connection. For more information, see “Establishing a Web Browser Session” on page 2-3.
2. Click HereUAre. The HereUAre Setup screen appears.



3. Configure the parameters. When you are finished, click Submit Changes and follow the instructions that appear on your screen to save your changes.

The following table explains each parameter.

Parameter	Explanation
Server IP	Indicates the IP address of the server.
Controlled ports	Sets the port control.
Secure Server	Enables or disables the server security. If you enable the security, you must click Submit Changes and follow the instructions that appear on your screen to save your changes. You can then configure the encryption and authentication keys.



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